Weather Bureau, which also gives the height of the thermometers above the ground at each station. The mean temperature is given for each station in Table II, for voluntary observers.

The *monthly mean temperatures* published in Table I, for the regular stations of the Weather Bureau, are the simple means of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *regular diurnal period* in temperature is shown by the hourly means given in Table V for 29 stations selected out of 82 that maintain continuous thermograph records.

The *distribution of the observed monthly mean* temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart IV; the lines are drawn over the Rocky Mountain Plateau region, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The *highest mean temperatures* were: In the United States, Yuma, 80.4; Phœnix, 79.5; Key West, 77.8; Corpus Christi, 75.8. In Canada, Bermuda, 70.0; Spences Bridge, 61.5; Battleford and Swift Current, 56.9; Calgary, 55.8; Edmonton, 55.4. The lowest were: In the United States, Sault Ste. Marie, 45,8; Marquette, 47.6; Eastport, 46.2; Portland, Me., 46.6; Alpena, 48.6. In Canada, Father Point, 42.8; White River, 45.6; Port Arthur, 45.8; Sydney, 47.2; St. Johns, N. F., 47.8.

*As compared with the normal* for May the mean temperature for the current month was in excess over the Plateau Region, the northern and the Pacific slopes, the Canadian Northwest Territories and Maritime Provinces. It was deficient in the Mississippi Valley, Atlantic States, and the Lake Region.

The greatest excesses were: In the United States, Havre, 7.3; Miles City, 7.1; Helena and Idaho Falls, 7.0; Winnemucca, 6.9; Rapid City, 6.7. In Canada, Swift Current, 5.9; Edmonton, 5.8; Calgary, 4.8; Qu'Appelle, 4.2. The largest deficits were: Cincinnati, 5.0; Parkersburg and Indianapolis, 4.9: Pittsburg and Louisville, 4.5; Lexington, 4.0. In Canada, Quebec, Montreal, and Toronto, 1.4; Saugeen, 1.2; Kingston, 0.9.

*Considered by districts* the mean temperatures of the current month show departures from the normal as given in Table I. The greatest positive departures were: Northern Slope, 5.6; middle Plateau, 5.2; northern Plateau, 5.0. The greatest negative departures were: South Atlantic, 1.5; Florida Peninsula and East Gulf, 1.6; Ohio Valley and Tennessee, 3.9.

*In Canada.*—Prof. R. F. Stupart says:

In British Columbia and the Northwest Territories the mean temperature of the month was very much above average, the greatest excess being between 9° and 12° in southern Alberta. The line of no departure passes through eastern Manitoba, Port Arthur, and White River. Nearly all Ontario shows a mean temperature ranging from average to 3° below. Quebec stations all show about 1° degree below average. In the Maritime Provinces the departure ranged from zero to plus 3°.

*The years of highest and lowest mean temperatures* for May are shown in Table I of the REVIEW for May, 1894. The mean temperature for the current month was the highest on record at: Red Bluff, 72.6; Fresno, 71.7; Sacramento, 67.0; Walla Walla, 65.3; Salt Lake City, 63.4; Spokane, 62.4; Winnemucca, 60.8; Havre, 60.6; Helena, 60.0; Rapid City, 59.8; Carson City, 59.4; Idaho Falls, 58.6; Baker City, 58.2. It was the lowest on record at: Parkersburg, 58.6; Indianapolis, 58.8; Lexington, 59.4; Cincinnati, 59.5; Louisville, 61.6; Nashville, 64.4.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: 104, Phœnix (28th); 102, Yuma (28th); 100, Walla Walla (29th); 99, Fresno (20th); 98, Red Bluff (19th); 95, Spokane (29th). The lowest maxima were: 64, Eastport (5th); 65, Woods Hole (18th); 66, Nantucket (frequently); 67, San Diego (frequently) and Tatoosh Island (13th); 68, Block Island (18th); 70, Eureka (11th) and Narragansett Pier (18th). The highest minima were: 70, Key West (8th); 62, Galveston (1st); 60, Corpus Christi (2d); 59, Port Eads (frequently). The lowest minima were: 24, Northfield (8th); 25, Williston (13th); 26, Moorhead (24th); 27, Huron (24th), Idaho Falls (8th); 28, Bismarck and North Platte (14th), Cheyenne (9th); 29, Carson City and Winnemucca (8th), Lander (9th).

The *years of highest maximum and lowest minimum temperatures* for May are given in the last four columns of Table I of the REVIEW for May, 1896. During the current month the maximum temperatures were equal to or above the highest on record at: Walla Walla, 100; Spokane, 95; Idaho Falls, 89; Baker City, 88; Fort Canby, 85. The minimum temperatures were equal to or below the lowest on record at: Cincinnati and Columbus, Ohio, 33.

The *greatest daily range of temperature and the data for computing the extreme and mean monthly ranges* are given for each of the regular Weather Bureau stations in Table I. The largest values of the greatest daily ranges were: Moorhead, 48; Williston, 45; Huron and Havre, 44; Bismarck and Carson City, 43. The smallest values were: San Diego, 11; Galveston, 13; Key West, 14; Nantucket, 15; Tatoosh Island, 18; Block Island and Hatteras, 19.

Among the *extreme monthly ranges* the largest were: Williston, 65; Moorhead, 64; Bismarck and Idaho Falls, 62; Winnemucca, 61; Walla Walla and Huron, 60. The smallest values were: Key West, 16; San Diego, 17; Galveston, 21; Woods Hole, 23; Tatoosh Island, 24; Nantucket, 25; Block Island, Hatteras, Port Eads, and Corpus Christi, 26.

*Accumulated monthly departures from normal temperatures* from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column for comparison with the departures of current conditions of vegetation from the normal condition.

| Districts. | Accumulated departures. | | Districts. | Accumulated departures. | |
|---|---|---|---|---|---|
| | Total. | Average. | | Total. | Average. |
| | ° | ° | | ° | ° |
| New England | + 5.6 | + 1.1 | South Atlantic | — 0.5 | — 0.1 |
| Middle Atlantic | + 2.4 | + 0.5 | East Gulf | — 1.0 | — 0.2 |
| Florida Peninsula | + 0.9 | + 0.2 | Ohio Valley and Tenn. | — 1.5 | — 0.3 |
| West Gulf | + 4.5 | + 0.9 | North Dakota | — 3.9 | — 0.8 |
| Lower Lake | + 3.8 | + 0.8 | Southern Slope | — 0.8 | — 0.2 |
| Upper Lake | + 8.3 | + 1.7 | Southern Plateau | — 3.4 | — 0.7 |
| Upper Mississippi Valley | + 1.5 | + 0.3 | Middle Plateau | — 4.1 | — 0.8 |
| Missouri Valley | + 0.9 | + 0.2 | Middle Pacific | — 2.5 | — 0.5 |
| Northern Slope | + 1.0 | + 0.2 | South Pacific | — 2.2 | — 0.4 |
| Middle Slope | + 2.3 | + 0.5 | | | |
| Northern Plateau | + 9.5 | + 1.9 | | | |
| North Pacific | + 0.2 | + 0.0 | | | |

## MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by the weight of the vapor coexisting with the air contained in a cubic foot of space, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-point for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, is given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer. The mean wet-bulb temperature is now published in Table I; it is always intermediate, and

generally about half way between the temperature of the air and of the dew-point. The quantity of water evaporated in a unit of time from the muslin surface may be considered as depending essentially upon the wet-bulb temperature, the dew-point, and the wind.

The *relative humidity*, or the ratio between the moisture that is present in the air and the moisture that it would contain if saturated at its observed temperature is given in Table I as deduced from the 8 a. m. and 8 p. m. observations. The general average for a whole day or any other interval would properly be obtained from the data given by an evaporometer, but may also be obtained, approximately, from frequent observations of the relative humidity.

## PRECIPITATION.

[In inches and hundredths.]

The *distribution of precipitation* for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The total precipitation for the current month exceeded 10 inches in the neighborhood of Jupiter, and exceeded 6 inches in southeast Florida, central Texas, southern Maine, Connecticut, New York, northern New Jersey, and eastern Pennsylvania. Little or no rain fell in the central and southern Plateau Region and California.

The larger values for regular stations were: Jupiter, 10.73; Portland, Me., and Eastport, 7.88; Washington, 6.97; Baltimore, 6.88.

Details as to *excessive precipitation* are given in Tables XI and XII.

The *diurnal variation*, as shown by tables of hourly means of the total precipitation, deduced from the self-registering gauges kept at the regular stations of the Weather Bureau, is not now tabulated.

The *current departures* from the normal precipitation are given in Table I, which shows that precipitation was in excess in New England, and especially in northwestern Texas and eastern New Mexico. It was deficient in the Valley of the Mississippi and tributaries.

The large excesses were: Jupiter, 4.9; Eastport, 4.2; Santa Fe, 3.3; Baltimore, 3.1; Washington, 3.0; Amarillo, 2.4. In Canada, Yarmouth, 2.5; Quebec, 2.0. The large deficits were: New Orleans and Little Rock, 4.6; Vicksburg, 4.0; Springfield, Mo., and Yankton, 3.6; Kansas City and Montgomery, 3.4; Meridian and Atlanta, 3.2; Topeka and St. Louis, 3.0.

The *average departure* for each district is given in Table I. By dividing each current precipitation by its respective normal the following corresponding percentages are obtained (precipitation is in excess when the percentage of the normal exceeds 100):

Above the normal: New England, 120; Middle Atlantic, 135; Florida Peninsula, 130; southern Slope, 165; southern Plateau, 300.

Below the normal: South Atlantic, 63; east Gulf, 31; west Gulf, 59; Ohio Valley and Tennessee, 87; lower Lake, 89; upper Lake, 76; North Dakota, 37; upper Mississippi, 43; Missouri Valley, 37; northern Slope, 49; middle Slope, 80; middle Plateau, 56; northern Plateau, 74; north Pacific, 61; middle Pacific, 21; south Pacific, 19.

*In Canada.*—Prof. R. F. Stupart reports:

The rainfall was considerably below the average in British Columbia, and less so in the Northwest Territories and Manitoba. It was somewhat in excess in Ontario and Quebec. It was slightly above average in Prince Edward Island and eastern Nova Scotia, but very excessive in southern New Brunswick and western Nova Scotia.

The *years of greatest and least precipitation* for May are given in the REVIEW for May, 1890. The precipitation for the current month was the greatest on record at: Santa Fe, 4.35. It was the least on record at: Columbus, Mo., 3.19; Raleigh, 2.85; Springfield, Mo., 2.48; Kansas City, 1.24; Nashville, 1.22; Cairo, 1.12; Chicago, 0.84; Moorhead, 0.80; Eureka, 0.75; Montgomery, 0.68; Havre, 0.42; Miles City, 0.35; Atlanta, 0.34; Tampa, 0.33; Carson City, 0.23; North Platte, 0.11; Red Bluff, 0.06: Point Reyes Light, 0.02; Fresno, 0.00.

The *total accumulated monthly departures* from January 1 to the end of the current month are given in the second column of the following table: The third column gives the percentage of the current accumulated precipitation relative to its normal value.

| Districts. | Accumulated departures. | Accumulated precipitation. | Districts. | Accumulated departures. | Accumulated precipitation. |
|---|---|---|---|---|---|
| | *Inches.* | *Per ct.* | | *Inches.* | *Per ct.* |
| Florida Peninsula | + 5.60 | 138 | New England | — 1.00 | 89 |
| Ohio Valley and Tenn. | + 2.30 | 111 | Middle Atlantic | — 1.50 | 82 |
| Upper Mississippi Valley. | + 1.80 | 114 | South Atlantic | — 1.50 | 93 |
| Missouri Valley | + 0.70 | 106 | East Gulf | — 1.80 | 93 |
| Middle Slope | + 1.20 | 114 | West Gulf | — 2.70 | 86 |
| Southern Slope | + 2.30 | 131 | Lower Lake | — 1.20 | 91 |
| Southern Plateau | + 2.30 | 197 | Upper Lake | — 0.30 | 98 |
| Middle Plateau | + 0.40 | 106 | North Dakota | — 0.70 | 89 |
| South Pacific | + 0.90 | 112 | Northern Slope | — 0.80 | 87 |
| | | | Northern Plateau | — 0.20 | 98 |
| | | | North Pacific | — 1.90 | 93 |
| | | | Middle Pacific | — 2.40 | 87 |

## SNOWFALL.

The *total monthly snowfall* at each station is given in Tables I and II. The chart of geographical distribution is omitted for this month.

Snowfalls of from 4 to 23 inches were reported from mountain stations in Colorado; from 1 to 2½ inches in the mountains of western Montana; 4 inches or less in Ohio, Indiana, Kentucky, and West Virginia, and generally a trace in central Maine, the upper Lake Region, Wisconsin, and Minnesota.

The *depth of snow on the ground* was not appreciable at the end of the month.

*In Canada.*—The map for May, published by Prof. R. F. Stupart, makes no special mention of snowfall, but local reports show that light snows fell in Manitoba and the region north of Lake Superior; also in New Brunswick, Nova Scotia, and Newfoundland, but all disappeared very soon.

## HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 12. Arizona, 19, 29. Arkansas, 28. California, 14, 15, 23. Colorado, 4, 5, 8, 9, 14, 16, 18, 20, 21, 24, 29, 30. Delaware, 18, 21. District of Columbia, 24. Florida, 15, 24. Idaho, 3, 6, 7, 8, 15, 19, 20, 24, 25, 30, 31. Illinois, 8, 9, 13, 14, 15. Indiana, 9, 11, 14, 15, 20 to 24. Indian Territory, 10. Iowa, 8, 10, 12, 13, 14, 19. Kansas, 2, 8, 9, 10, 21, 22, 25. Kentucky, 9, 23, 24. Louisiana, 1, 11, 13, 14. Maine, 7, 29. Maryland, 21, 24, 25. Massachusetts, 7. Michigan, 11, 13, 14, 19, 23, 30. Minnesota, 11 to 15. Mississippi, 8, 30. Missouri, 2, 8, 20, 22, 26, 28. Montana, 9, 16, 30. Nebraska, 10, 11, 17, 18, 20, 31. Nevada, 1, 2, 7, 8, 17, 18, 21, 23, 24. New Jersey, 21. New Mexico, 3, 4, 6, 15 to 21, 23, 25, 26, 27. New York, 4. North Carolina, 1, 5, 13, 14, 17, 24, 29, 30. North Dakota, 7, 10, 11, 25, 26. Ohio, 9, 12, 14, 15, 16, 20, 23, 24, 27. Oklahoma, 4, 6, 8, 9, 10, 12, 13, 22. Oregon, 4 to 7, 16, 24. Pennsylvania, 16, 21, 23, 24. South Dakota, 8, 11, 12, 13, 16, 18, 26. Tennessee, 8, 9, 21, 24. Texas, 4 to 7, 10 to 13, 16, 17, 23. Utah, 1, 15, 20, 24. Virginia, 1, 5, 11, 16, 17, 21, 23, 24. Washington, 5, 6, 7, 12, 29, 30. West Virginia, 24, 29, 30. Wisconsin, 12, 13, 14, 29, 31. Wyoming, 2, 19.